CLAIMS

1. Synchronous rectification device (10) of the H-bridge type supplying a coil (5) of a phase of a synchronous machine, comprising four switches (21, 31, 22, 32) disposed on the electrical links (11, 12) of this H-bridge and intended to be instructed by an electronic circuit (40), characterized in that each switch comprises at least one transistor (T1) instructed as a diode or otherwise by the electronic circuit (40) depending on whether or not the intensity I of the current crossing the coil exceeds a predetermined threshold S.

2. Device according to Claim 1, in which each switch consists of a certain number (n) of transistors (T1, ..., Tn) in parallel, the said number being determined by the power to be dissipated therein.

3. Device according to Claim 2, in which the numbers (n) of operational transistors in the switches are chosen from 3 to 5.

4. Device according to one of Claims 1 to 3, in which the transistors (T1, ..., Tn) are all identical.

5. Device according to one of Claims 1 to 4, in which the transistors are MOSs.

6. Polyphase synchronous electric machine (10, 20, 30, 40, 50) with per phase a coil (5) supplied, by a DC supply (20), under the control of a synchronous rectification device (10) according to one of Claims 1 to 4, comprising four switches (21, 31, 22, 32) instructed by an electronic circuit (40) and characterized in that the electronic circuit (40) is designed to instruct the four switches (21, 31, 22, 32) in distinct pairs, each pair consisting of two of the four switches, always chosen in series with the coil

(5), all the pairs being alternately instructed ($\phi 1, \ldots, \phi 6'$; $\phi, \ldots, \phi 6'$), either to supply the coil (5) with forward (A1) or reverse (A2) current (I), or else to restore the energy accumulated therein.

7. Machine according to Claim 6, in which, a sensor (45) of current (1) being provided on the circuit of the coil (5), the electronic circuit (40) is designed to instruct a pair of switches in synchronous mode (M2, M2') if the current (I) in the coil (5) is greater in absolute value than a predetermined threshold (S), otherwise in asynchronous mode (M1, M1'), the transistors concerned then intervening only through their internal diode, the other two switches being instructed to close.

8. Machine according to Claim 7, in which the electronic circuit (40) for instructing the switches is designed to offset (Δt) the instructions for the said switches in time upon the change of mode (M1, M2; M1', M2') to avoid the short-circuiting of the DC supply (20).

9. Machine according to one of Claims 6 to 8, comprising on its rotor (1) a sensor of angular position (42) of the rotor (1) linked to the electronic circuit (40), characterized in that the electronic circuit (40) is designed to instruct the polyphase synchronous machine as a function of the position (θ) of the rotor according to a motor mode or a generator mode, in accordance with a usage cue (M) delivered by the engine processor of a motor vehicle.